

particular of the so-called "Sparagmite" or fragmental accumulations below the Primordial zone. He believes that the older gneiss may include metamorphosed portions of younger formations, in particular considerable masses of the Primordial rocks. This question in another form is discussed in Part IV., which treats of the geology of Central Norway. To the oldest sedimentary formations, termed the Sparagmite series, a thickness of 2,300 Norwegian feet is there assigned. They consist of sandstones, conglomerates, schists, slates, and limestones. Above them lie the Primordial beds, 2,900 feet thick, composed of quartz-schists, mica-schists, "blue-quartz," sandstones, clay-slates, and limestones, among which are found the earliest fossils (*Dicyonema*, *Olenellus*, &c.). Above these rocks the unfossiliferous red sandstones and conglomerates of the west coast (? Old Red Sandstone), long since described by Naumann, close the geological record until the deposits of the Glacial period. Dr. Kjerulf brings forward many facts regarding the metamorphism of the older palaeozoic rocks in Central Norway, and traces with clearness the passage of these rocks into schistose and gneissose masses as they approach the larger areas of granite. Part V. is devoted to a brief exposition of the geology of the Trondhjem district. Part VI. discusses the lithology of the eruptive rocks. The various species and varieties of granite, syenite, porphyry, gabbro, greenstone, olivine-rocks, &c., are here described with remarkable succinctness alike as to their composition and geological relations. Considering the meagreness of the official equipment of the Geological Survey, this portion of their work must be admitted to be specially creditable to the Norwegian geologists. In Parts VII. and VIII. information is given regarding the structure of rocks and mineral veins. Some nature-printed illustrations of rock-structure here inserted are interesting. Slices of foliated, graphic, and porphyritic granite, etched with hydrofluoric acid, have allowed the more durable quartz to print its figure upon paper, and the impression has then been photographed on wood and cut into a woodcut. Some figures are also added to show the coexistence of organic remains (graptolites, corals) with crystals of chiastolite, vesuvianite, and other minerals in metamorphosed Silurian rocks.

A useful feature in the German translation is the addition of an index, which is wanting in the original, but which would have been still more acceptable had it been even fuller than it is. The numerous woodcut sections enable a reader to follow the local descriptions in the text. But the addition of a good geological index-map, such as that which accompanies the Norwegian volume, would have been of much service, and might perhaps have been given without any very serious increase of price. But this is a defect which every geological reader, at a little cost to himself, can remedy by obtaining the general map. He will find in Dr. Gurlt's version of Dr. Kjerulf's memoir an invaluable compendium of Norwegian geology, and will probably be induced to set out h.m.-et to make a personal exploration of the sections which are therein described. Should he be induced so to do it will doubtless come to look back on his tour in Norway as one of the most instructive as well as delightful of all his geological rambles.

ARCH. GEIKIE

EUCALYPTOGRAPHIA

Eucalyptographia; being a Descriptive Atlas of the Eucalypts of Australia and the Adjoining Islands. By Baron F. von Mueller, K.C.M.G., M. and Ph.D., F.R.S., Government Botanist for the Colony of Victoria. Decades 1 and 2. (Melbourne and London, 1879.)

MATERIAL for the issue of this atlas was accumulated at Melbourne now over thirty years ago, and the study of this fine group of the myrtles has been carried on ever since, as opportunities presented themselves by Dr. Mueller. Still the subject was so large and the perplexities surrounding it so many that even now he offers his observations in these decades as only fragments toward a some day complete monograph. The difficulties surrounding the study of this group are many. There is the large number of species, the genus *Eucalyptus* being surpassed in this respect only by *Acacia*. The resemblance of many specific forms is apt to deceive one; the fruits, and more especially the flowers, are often far out of the reach of the ordinary traveller, even though he might in his enthusiasm not object to climb for a considerable height into the trees; and then the species themselves are widely distributed over the whole of the Australian continent and Tasmania, some even extending to the Indian Ocean Islands, though, it may be added, none occur in New Zealand.

Mr. Bentham's grouping of the species has been, with some trifling modifications, adopted by the author, and the Government of West Australia has borne the expense of issuing these two decades, which contain descriptions of some of the most important timber trees of the great western colony. It is to be hoped that some of the other colonial governments may follow this good example, and so help on the publication of the work. Perhaps even our own Royal Society might see their way to help it by a grant in aid out of the fund placed at their disposal by Parliament for promoting scientific research.

The economic value of these eucalypts needs scarcely to be insisted on. Not only do they yield excellent hard timber, but as products we find enumerated oils, tars, acids, dyes, tan, and potash. What magnificent forest trees are to be found among them will appear from the description of some of the species figured in these parts. One (*E. goniocalyx*) is mentioned as growing on low or hilly woodlands up to about 3,000 feet, and attaining in some of the forest valleys a height of 300 feet, with a stem diameter of not rarely six feet, and sometimes even ten. The timber of this species is described as hard and tough, exceedingly durable, lasting well when buried underground, not warping, and difficult to split. Another species (*E. leucoxylon*) known as the iron bark tree, or white gum tree, grows to a height of 200 feet, has a timber of great hardness, durability, and of extraordinary strength. On being burnt for charcoal it yielded 28 per cent. of superior stuff, 45 per cent. of crude pyroligneous acid, and 6 per cent. of tar. An excellent packing paper has been prepared from the inner layers of the bark, as can indeed be done from the inner bark of most eucalypts, and the leaves yield a volatile oil to the extent of about 1 per cent.

The genus thus abounding in useful products is not

wanting either in remarkable forms; thus *E. alpina* is found only on the summit of Mount William, Victoria, at an elevation of over 4,000 feet, and its area is limited to the top of this one peak, for it does not even extend to any of the other summits of the chain of which Mount William is the culminating point. This species has been cultivated in the Melbourne Gardens from seeds collected in 1853, but even in good soil it retains a dwarf bushy habit, having in a quarter of a century not grown over a dozen feet in height, and showing little tendency to form a distinct stem. This species offers, perhaps, the most remarkable example of limited geographical distribution in the group. The Honey-scented Eucalypt (*E. melliodora*) is what is called, among such giants, a middle-sized tree, exceptionally attaining a height of some 200 feet; it will live on poor soil. In an official report presented in 1869 to the Victorian Parliament, Dr. Mueller pointed out that one ton weight of its branches and leaves, if gathered fresh, would yield about 2 lb. 12 oz. of pure potash, and a much larger quantity of crude pearl-ash. Another species, known from its odour as the "peppermint tree" (*E. odorata*), would seem to be a great favourite with a destructive nocturnal cockchafer. Through the immense clearings effected for agricultural settlements, the number of insect-eating birds has greatly diminished, and the increase of this species of Melolontha is not properly kept in check. They prey on the foliage of this Eucalypt, and Mr. Otto Tepper, writing in the *Transactions of the Philosophical Society of Adelaide* (February, 1878), states that it is being extensively destroyed from this fact.

The plates accompanying the descriptions of the species published in these decades give ample details of the leaves, flowers, and fruits of the species; they appear, so far as the stems with inflorescences are concerned, to be perhaps a little too stiff and formal. Sometimes details of the peculiar wood structures are added, and on one special plate transverse sections of the anthers of some fifty-eight species are figured. The London agents for this work are Messrs. Trübner and Co.

OUR BOOK SHELF

A Short Geography of the British Islands. By John Richard Green, M.A., LL.D., and Alice Stopford Green. (London: Macmillan and Co., 1879.)

"GEOGRAPHY, as its name implies, is an 'earth-picturing,' a presentment of earth, or a portion of earth's surface in its actual form, and an indication of the influences which that form has exerted on human history or human society. To give such a picture as this of our own country, in however short and simple a fashion, is the aim of the present work." Mr. and Mrs. Green have carried out the task they have here indicated in a masterly manner. The method they have adopted is the only scientific method on which a text-book of geography of this class can be constructed. Mr. Green, in his preface, speaks with just horror of the majority of textbooks, with their dreary array of tables and "facts" and figures, which makes what ought to be one of the most interesting of lessons a burdensome and unprofitable penance.

In the first seven chapters the authors give a clear, instructive, and completely interesting sketch of the great physical features of our islands, and of their relation to the continent of Europe. The mountain groups, the uplands, the plains, and the rivers are brought before the student in

their natural or scientific aspect, with just such details easily worked in as will give a clear picture of the various features. The counties are then grouped in their natural order, and each is treated after the same method as that followed in the general sketch. The great physical features are brought out first of all, the regions of the chief natural resources of the country indicated, and thus the mind of the pupil is prepared to understand how the political, social, and industrial features have come to be developed as we find them at the present day. "Facts" enough to satisfy any humane examiner are given, and the principal data and figures are collected in a few well-arranged tables. Great care has evidently been taken to obtain accurate and recent information both with regard to physical geography and topographical, industrial, and other statistics. Besides four coloured maps, there are twenty-four special sectional maps appropriately introduced throughout the book, which must prove of great use in impressing the facts upon the mind of the learner. We trust the Geography will be largely introduced into our schools; we are sure that the scholar at least would welcome it. Its style and method, moreover, render it attractive and instructive reading to those who have long left the school of their childhood behind.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

The Visibility of Mercury to the Naked Eye

IN NATURE, vol. xxi. p. 474, I find the following: "Mercury was seen at Paris on May (meant for March) 10 and 11 with the naked eye, owing to the transparency of the atmosphere and the great elongation of the planet. . . . The observation was made by MM. Henry brothers at the Paris Observatory."

Must not "the transparency of the atmosphere" have more to do with the visibility of this planet than is usually supposed? The leading circumstances affecting the question, the amount of the planet's elongation, the inclination of the ecliptic in which it is situated to the horizon, heliocentric latitude, &c., being of course the same at each apparition in England, on the Continent, and in North America, how shall we otherwise account for some of the facts of the case? The remark is current respecting Copernicus that he never obtained a view of Mercury. And perhaps the general impression as to its visibility—that it can be seen only at the most favourable junctures, and for but a few days at a time—is reflected in the quotation above.

As a contribution to the question as it may be affected by the variable element of *climate, atmosphere*, I tabulate herewith the results of several years' careful though not thoroughly systematic observation of the planet at this geographical position, latitude 44° 53' N., longitude 93° 05' W., elevation 800 feet above sea-level:—

Year.	Time observed.	Days.	G. Elong.	Date.
1877	... April 29 to May 11 ... 13 ... 21'	5	...	May 3
1878	... Sept.-Oct. ... — ... 17 53	53	...	Sept. 26
1879	... Jan. 7 to Jan. 29 ... 22 ... 24 03	03	...	Jan. 16
1880	... Feb. 29 to March 19 ... 20 ... 18 22	22	...	March 10

It will be observed from the table that I followed Mercury with the naked eye at its last appearance in the west (when it was seen in Paris), from February 29 to March 19. I had intended to look for it a day sooner, February 28, as a crucial test as to how early it could be seen at that apparition, for it came into conjunction with Jupiter that day and would be approximately pointed out by the latter planet. But the state of the sky would not permit. Looking for Jupiter the next evening, so as to take bearings from him, I saw Mercury first, over a degree to the north-east of where Jupiter was when found. So I am confident that Mercury was within reach of the naked